THAT WHICH IS CLAIMED:

1. A fiber amplifier comprising:

a longitudinally extending inner core capable of transmitting signals;

an outer core surrounding said inner core and extending longitudinally therealong, wherein said outer core is capable of transmitting pump energy such that the pump energy at least partially amplifies signals propagating through said inner core, wherein said outer core is capable of accepting pump energy within a first range of acceptance angles in a first direction and within a second range of acceptance angles in a second direction that is perpendicular to the first direction,; and

a cladding layer at least partially surrounding said outer core, wherein said outer core and said cladding layer are structured such that a numerical aperture of the fiber amplifier in the first direction is different than the numerical aperture of the fiber amplifier in the second direction.

2. A fiber amplifier according to Claim 1 which defines first and second orthogonal axes extending through said inner core and in the first and second directions, respectively, wherein the fiber amplifier includes first and second mutually exclusive segments which include and surround the first and second orthogonal axes, respectively, wherein said outer core within the second segment of the fiber amplifier at least partially interfaces with a material that has a refractive index different than the refractive index of said cladding.

3. A fiber amplifier according to Claim 2, wherein said cladding layer is disposed entirely within the first segment.

4. A fiber amplifier according to Claim 2, wherein the material has a refractive index smaller than the refractive index of said outer core and the refractive index of said cladding layer.

5. A fiber amplifier according to Claim 2, wherein the material is disposed radially within said outer core in at least two locations on opposite sides of said inner core.

6. A fiber amplifier according to Claim 1, wherein a portion of the pump energy diverges in the first direction and a portion of the pump energy diverges in the second direction, wherein a portion of the pump energy diverges in the first and second directions prior to being accepted by said outer core, and wherein the portion of pump energy that diverges in the second direction diverges more than the portion of pump energy that diverges in the first direction.

7. A fiber amplifier according to Claim 1, wherein said cladding layer defines at least one opening through which said outer core is exposed, the fiber amplifier further comprising at least one prism disposed within a respective opening defined by said cladding layer and extending laterally outward therefrom, wherein said outer core is capable of accepting pump energy through said at least one prism.

8. A fiber amplifier according to Claim 7, wherein said at least one prism comprises a first face disposed proximate said outer core, a second face through which pump energy is injected, said second face extending outwardly from one end of said first face at an acute angle therefrom, and a third face extending outwardly from one end of said first face at an acute angle from said first face, and further comprising a reflective surface disposed proximate said third face.

9. A fiber amplifier according to Claim 7, wherein said at least one prism comprises a first face disposed proximate said outer core, a second face extending outwardly from one end of said first face at an acute angle therefrom, and a third face extending outwardly from one end of said first face at an acute angle from said first face, and wherein said second face comprises an integral lens for directing pump energy entering said prism through said second face.

10. A fiber amplifier comprising:

a longitudinally extending inner core;

an outer core surrounding said inner core and extending longitudinally therealong; and

a cladding layer at least partially surrounding said outer core, wherein said outer core and said cladding layer are structured such that a numerical aperture of the

fiber amplifier in a first direction is different than the numerical aperture of the fiber amplifier in a second direction.

11. A fiber amplifier according to Claim 10, wherein the first direction is perpendicular to the second direction, and wherein said inner and outer cores extend in a longitudinal direction perpendicular to both the first and second directions.

12. A fiber amplifier according to Claim 11 which defines first and second orthogonal axes extending through said inner core and in the first and second directions, respectively, wherein the fiber amplifier includes first and second mutually exclusive segments which include and surround the first and second orthogonal axes, respectively, wherein said outer core within the second segment of the fiber amplifier at least partially interfaces with a material that has a refractive index different than the refractive index of said cladding.

13. A fiber amplifier according to Claim 12, wherein said cladding layer is disposed entirely within the first segment.

14. A fiber amplifier according to Claim 12, wherein the material is disposed radially within said outer core and within the second segment in at least two locations on opposite sides of said inner core.

15. A fiber amplifier according to Claim 10, wherein the material has a refractive index smaller than the refractive index of said outer core and the refractive index of said cladding layer.

16. A fiber amplifier according to Claim 10, wherein said cladding layer defines at least one opening through which said outer core is exposed, the fiber amplifier further comprising at least one prism disposed within a respective opening defined by said cladding layer and extending laterally outward therefrom, wherein said outer core is capable of accepting pump energy through said at least one prism.

17. A fiber amplifier according to Claim 16, wherein said at least one prism comprises a first face disposed proximate said outer core, a second face through

which pump energy is injected, said second face extending outwardly from one end of said first face at an acute angle therefrom, and a third face extending outwardly from one end of said first face at an acute angle from said first face, and further comprising a reflective surface disposed proximate said third face.

18. A fiber amplifier according to Claim 16, wherein said at least one prism comprises a first face disposed proximate said outer core, a second face extending outwardly from one end of said first face at an acute angle therefrom, and a third face extending outwardly from one end of said first face at an acute angle from said first face, and wherein said second face comprises an integral lens for directing pump energy entering said prism through said second face.

19. A fiber amplifier comprising:

a longitudinally extending inner core;

an outer core surrounding said inner core and extending longitudinally therealong, wherein said outer core includes major opposed surfaces and minor opposed surfaces; and

a cladding layer at least partially surrounding said outer core, wherein at least a portion of said cladding layer interfaces with the major opposed surfaces of said outer core to thereby define a first numerical aperture, and wherein the minor opposed surfaces of said outer core at least partially interface with a material to thereby define a second numerical aperture that is different from the first numerical aperture.

20. A fiber amplifier according to Claim 19 which defines first and second orthogonal axes extending through said inner core and the major and minor opposed surfaces, respectively, wherein the fiber amplifier includes first and second mutually exclusive segments which include and surround the first and second orthogonal axes, respectively, and wherein said outer core at least partially interfaces with the material within the second segment of the fiber amplifier.

21. A fiber amplifier according to Claim 20, wherein said cladding layer is disposed entirely within the first segment.

22. A fiber amplifier according to Claim 19, wherein the material has a refractive index smaller than the refractive index of said outer core and the refractive index of said cladding layer.

23. A fiber amplifier comprising:

a longitudinally extending inner core;

an outer core surrounding said inner core and extending longitudinally therealong, wherein said outer core includes a material disposed therein; and

a cladding layer at least partially surrounding said outer core, wherein at least a portion of said cladding layer interfaces with the said outer core to thereby define a first numerical aperture, and wherein said outer core interfaces with the material to thereby define a second numerical aperture that is different from the first.

24. A fiber amplifier according to Claim 23, wherein said outer core defines a plurality of voids within which the material is disposed.

25. A fiber amplifier according to Claim 23 which defines first and second orthogonal axes extending through said inner core and the major and minor opposed surfaces, respectively, wherein the fiber amplifier includes first and second mutually exclusive segments which include and surround the first and second orthogonal axes, respectively, wherein said cladding layer interfaces with said outer core within the first segment, and wherein the second segment includes the material.

26. A fiber amplifier according to Claim 24, wherein said outer core defines a plurality of voids within which the material is disposed, wherein more voids are within the second segment than in the first segment.

27. A fiber amplifier according to Claim 26, wherein the voids defined within said outer core in the second segment are symmetrical relative to said second axis.

28. A fiber amplifier according to Claim 23, wherein the material has a refractive index smaller than the refractive index of said outer core and the refractive index of said cladding layer.